

UO-D 200 - 400 P

Permeate-staged reverse osmosis units

The permeate-staged reverse osmosis is used for the desalination of softened water with a salinity of up to 1,000 mg/l and is equipped with a compact rotary vane pump. Due to the double-stage design, a permeate conductivity of approx. 5 $\mu\text{S}/\text{cm}$ is typically reached. The RO digital microprocessor controller (one controller per stage) enables fully automatic operation with logging of all relevant operating data and freely adjustable limit values. The unit can be connected to the central control system via an optional Profinet interface.

BENEFITS

- Very good permeate quality is achieved through two-stage design
- Subsequent upgrade from standard to permeate-staged unit easy to carry out
- Flexible installation in confined spaces, stages can even be spatially separated if required

APPLICATIONS

- Desalination of softened water
- Ideal for applications with strict requirements on permeate conductivity (e.g. in surface technology, chemical industry, laboratory technology etc.)



UO-D 1250 P/FU

UO-D 200 - 400 P

Permeate-staged reverse osmosis units

DESCRIPTION

Permeate-staged reverse osmosis

- Two compact units, each completely mounted under a designer plastic cover to protect against environmental influences
- Two base frame panels made of powder coated steel
- Pre-filter RO (5 µm) with two glycerine-filled pressure gauges (first stage)
- Two high-pressure pumps rotary-vane type, pump in the second stage from stainless steel
- Low pressure element(s) with PA/PS composite membrane in stainless steel pressure vessel(s)
- Two connecting cables (3 meters) with 16 A – 6 h CEE three-pole plug
- Unit incl. piping and wiring, connection of the two stages via hoses (pre-fitted hoses with screw fittings are included), electrical construction acc. to VDE 0100 Part 600, VDE 0113 Part 1
- Unit tested, parameterised and conserved in own test field

Fittings and instrumentation

- Inlet solenoid valve (first stage)
- Sampling valves for feed water and permeate (first and second stage)
- Valves to regulate flow rate of permeate and concentrate (first and second stage)
- Pressure sensors for pump feed pressure and operating pressure each stage
- Flow sensors for permeate and concentrate each stage
- Conductivity measurement of permeate with temperature compensation each stage

Two RO digital microprocessor controllers

- Fully automatic monitoring and control, easy menu navigation with six buttons
- Four-line illuminated display and two LEDs as local signals for operation and fault
- Languages of the plain text display: German / English / French / Spanish
- Circular storage of operation data (1,960 data sets) with adjustable storage interval
- Operational reliability through adjustable limit values with fault message and display
- Password-protected programming of operating parameters

Available inputs

- DIGITAL: External stop (e.g. in case of interrupted feed water supply), motor protection / hard water, 2x level permeate tank (tank min / max) and 3x universal input (configurable)
- ANALOGUE: Level permeate tank (4 - 20 mA)

Available outputs

- DIGITAL: collective fault signal, universal output (configurable)
- ANALOGUE: conductivity permeate, measuring range 1 - 999 µS/cm (4 - 20 mA)

Optionally available

- Hardness monitoring device limitron and HR modules to increase the desalination rate
- Profinet interface (one per stage required)

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CONDITIONS OF USE

The unit may only be used for the desalination of softened feed water with drinking water quality or appropriately pre-treated well or surface water. The unit is designed for a salinity (TDS) of 1,000 mg/l and a temperature of 15 °C. Under these conditions, the projected permeate output is achieved even after three years of operation. The permeate yield depends on the raw water quality and the pre-treatment. The following parameters must be maintained in the feed water:

Free chlorine	not detectable
Iron (Fe)	< 0.2 mg/l
Manganese (Mn)	< 0.05 mg/l
Silica (SiO ₂)	< 25 mg/l
Silt density index (SDI)	< 3
Feed water temperature	5 – 35 °C
Feed water pressure	2 – 6 bar
Pressure fluctuation	± 0.5 bar

TECHNICAL DATA OF SERIES

Controller	RO digital
Desalination rate min.	99.5 %
Permeate recovery stage 1	75 - 80 %
Permeate recovery stage 2	85 %
Permeate back pressure max.	0.3 bar
pH value operation	6.5 – 9.5
pH value cleaning	2 – 12
Ambient temperature	5 – 40 °C

Product name	Mains connection	Hydraulic connection	Dimensions in mm	Item number
Permeate l/h	kW / V / Hz	feed/permeate/conc.	W x D x H	
UO-D 200 P	0.55 + 0.55 / 230 + 230 / 50 + 50	DN 20 / DN 10 / DN 10	880 x 400 x 1,260	387 190
UO-D 400 P	0.55 + 0.55 / 230 + 230 / 50 + 50	DN 20 / DN 10 / DN 10	880 x 400 x 1,260	387 191